Robert Howlett _ March 1861

40.2

ACKLAND'S

HINTS ON FOTHERGILL'S PROCESS.

Since the publication of my "Hints on Fothergill's Process" in September, 1858, various writers have added to our knowledge of this beautiful dry process; but there still remains a tendency to occasional stains, which detract from its merits and successful practice.

To ascertain the causes which give rise to these disagreeable imperfections, has been my aim for some time past, and I trust my labours have not been entirely unproductive.

Before giving the necessary manipulations, (which I propose to do very minutely,) a few words will not be deemed out of place to explain what I consider gives rise to these stains, and my reasons for the remedies proposed.

It has often been stated that a Collodion to be thoroughly adapted for this dry process must be of a porous nature, and made from Pyroxiline prepared in weak acids and at a high temperature; but my experiments negative such a statement, and success is much more constant if we employ a Collodion of nearly an opposite character.

This statement is made with all due respect to the opinions of those who entertain different ideas, and who strive to produce the supposed requisites by the addition to the Collodion of an ingredient highly pernicious to its structure. Any one testing the plan hereafter laid down will find that, with a Collodion yielding a compact film as here recommended, freedom from blemishes is much more certain than when using a Collodion of a different character; indeed, it may be at once stated that nearly every chance of success depends on the employment of a suitable Collodion, aided, of course, by careful manipulation.

Various samples of Collodion, when iodized and excited in the Nitrate Bath, will be found to yield films of quite different physical characters. These may be divided into three classes—the horny, the compact, and the porous; although, of course, many varieties will produce films of intermediate degrees.

The first or horny film dries rapidly after removal from the Nitrate Bath, is very repellant in its nature, often giving great obstacles to the "even" flow of the developer, retains with the utmost tenacity that portion of the Nitrate Bath which has penetrated the film during exciting. The Iodide of Silver is so firmly imbedded that a strong solution of Hyposulphite of Soda is some minutes in dissolving it out; whilst a weak solution has scarcely any action, and the film has a great tendency to split up on drying. The compact film is less repellant both of water and the developer; dries less rapidly, allows the Bath Solution to be partially removed by long and continued washings; a solution of Hyposulphite of Soda (even if diluted) will remove the Iodide of Silver in a minute or two; and the film is not liable to split up on drying; unless in those cases where we carelessly employ damp or dirty glass plate. The porous film retains its moisture after removal from the Nitrate Bath for a considerable time; allows water and the developer to flow very freely over its surface; the Bath Solution retained in the film after exciting is easily removed

by even a small quantity of water; a solution of Hyposulphite of Soda will almost instantly remove the Iodide of Silver; and the film never splits up on drying, even if the glass plate used is imperfectly cleaned.

If we employ Collodions possessing the foregoing characters in the Fothergill's process, our results will differ very widely, and will at once teach us that the *physical* nature of the Collodion we use is even of greater importance than its *Photographic* action.

In order to prove this assertion, we will coat three Plates—No. 1 with a horny, No. 2 with a compact, and No. 3 with a porous Collodion, sensitize each in a 35 grain Nitrate Bath, wash in six drams of water for one minute, then pour dilute Albumen on and off six or seven times, and finally well wash and dry.

The first observable difference will be, that on removing No. 1 from the Nitrate Bath, the film is pale yellow, and slightly opalescent; No. 2 gives a rich creamy film; and No. 3 a dense creamy film, perfectly opaque.

On washing each Plate (after removal from the Nitrate Bath) in six drams of distilled water for one minute, another difference is observable; for, if we collect the washing waters (each in a separate bottle), and add a few drops of Chloride of Ammonium Solution to each, No. 1 will be rendered slightly opalescent; No. 2 decidedly so; and No. 3 very milky. This milkiness is dependent on the amount of Nitrate of Silver removed from the film, and clearly exemplifies that No. 1 Plate, possessing a horny film, has only lost its "surface" solution by the washing; No. 2 has not only lost its surface solution, but also a minute portion of that in the interior of the film; whilst No. 3 has lost much of the film solution, and nearly all on the surface.

On exposing and developing these three Plates, No. 1 will yield a hard picture, with deficiency of half tone, and a very weak sky; No. 2 will give us a superabundance of half tone, but here also the sky is thin and weak; whilst No. 3 will yield a dense sky, with a deficiency in the half tone.

As regards stains, No. 1 will have a stain much like the "water markings" on silk, and of a *darker* tint than the rest of the Plate, occupying nearly one third of its length.

No. 2 will be marked in a similar manner, but in a *much less* degree; whereas with No. 3 we have stains of a transparent nature proceeding from the end of the Plate at which the Albumen was first applied, and extended sometimes across it in a "wave-like" form.

With Collodions possessing the characteristics here given, these stains are nearly constant in their occurrence, and demand our careful study; and for this purpose we will take the two extreme cases No. 1 and No. 3, as No. 2 has defects similar to No. 1, but in a less degree. We have before seen that the surface solution of No. 1 is much diluted, whilst the "film" solution is but little removed with the washing waters, and being scarcely acted on by the Albumen mixture, it remains, and in drying flows downward, rises to the surface, and produces the "water markings;" those of a "wave-like" character never occurring with this kind of Collodion.

The washing of No. 3 Plate removes much of the Bath Solution from the interior, bringing a strong solution to the surface, which, decomposing the Albumen mixture, gives rise to the "wave-like" markings. The Albumen enters "into" the film, and most completely decomposes the "film" solution, so that none remains to cause stains in drying.

Having arrived at an explanation of the causes of these two difficulties, and I think it will be admitted these are our greatest impediments to success, it becomes our next object so to use our knowledge as to avoid such results in future experiments.

It has been seen that a horny film never yields "water markings," and that a porous Collodion is perfectly free from wave-like stains; that a compact Collodion yields the former markings in a less degree, but has abundance of middle tint, with deficiency of density. Our object therefore is so to modify a compact Collodion, that, whilst it retains its own merits, it may acquire the density possessed by a porous kind; and to alter our manipulation so as to decompose all the "film" solution, and thus prevent stains.

Having tested every kind of Collodion advised for this proccss, and finding none possessing *all* the requisites required, I selected that invented by Mr. Powell, and supplied by Horne and Thornthwaite; and having very slightly altered its Iodizing Solution, I find it comes nearer to perfection than any other, and when mixed as hereafter described, yields results of great beauty and softness, which are even superior to any by the wet process.

This Collodion yields a somewhat compact film, which, as we have before proved, is deficient in density, and liable to "water markings." To remedy the former, Tincture of Iodine is added to the newly Iodized Collodion, so as slightly to increase its porosity, and give density to the resulting picture; and the liability to "water markings" will be entirely removed if we allow the Albumen mixture time to permeate the film, and decompose the Bath Solution contained therein.

I will now proceed to give the necessary manipulations, and would suggest to any one intending to try the plan here advised, that they adhere *most strictly* to the formula and manipulations given, as the slightest deviation may lead to uncertain results, without the cause being suspected.

The plan here plainly described has been adopted after trying every known alteration of manipulation published up to the present time, and has been carefully tested by others as well as myself, and with more successful results than could be obtained by any other modification or formulæ.

The solutions for this process are as follows:—

Plate Cleaning Solution.
Tincture of Iodine.
Iodized Collodion.
Bath Solution.
Prepared Albumen.
Chloride of Ammonium Solution.
Pyrogallic Acid Solution.
Silver Developing Solution.
Fixing Solution.

PLATE CLEANING SOLUTION.

This is supplied by Horne and Thornthwaite, in four ounce bottles, at sixpence each.

TINCTURE OF IODINE.

Iodine	.....	20 grains.
Absolute Alcohol	....	2 ounces. Mix.

IODIZED COLLODION.

It has been before stated that a suitable Collodion is of the utmost importance. Powell's Collodion is specially adapted for our use, and is supplied by Horne and Thornthwaite with the Iodizing Solution separate. To iodize this Collodion for use in Fothergill's process, add two drams of the Iodizing Solution and six drops of Tincture of Iodine to six drams of Collodion, shake well together, and if time permits, allow it to settle for twelve hours, then pour off the upper clear fluid for use; but if time cannot be given for any deposit to fall to the bottom, it may be filtered through filtering paper, and so employed directly after being mixed.

This Collodion so iodized will retain all its essential qualities for about six or seven days in summer, and twice as long in winter, but no more should be mixed than can be used in a week. Should more be mixed than can be employed before it is too old for our purpose, it need not be discarded as useless, as it may be diluted with newly Iodized Collodion, and thus waste is prevented. The only thing to determine is how much old we may use to mix with the new. If the Collodion has not been iodized more than a month, I should mix it with one half newly Iodized Collodion, and diminish the Tincture of Iodine one third. If three months old, dilute one part with three parts of newly iodized, and diminish the quantity of Tincture of Iodine by one half; and should the Collodion have been iodized twelve months mix one part of it with four of newly iodized, and omit the Tincture of Iodine altogether; but whenever we wish to prepare a choice lot of Plates, newly Iodized Collodion with Tincture of Iodine is to be recommended.

This Collodion, when iodized a month, is in excellent condition for either the Oxymel, Gelatine, or Metagelatine process, and for views by the "wet" process.

For this latter purpose it has been pronounced by first-rate operators to be the best in the market, and can with confidence be used even if it has been iodized twelve months; whilst Mr. Llewelyn states his employment of this Col-

lodion for the Oxymel process has been followed by the most perfect success, and that it is admirably suited for dry processes generally.

BATH SOLUTION.

Nitrate of Silver fused.....	1 ounce.*
Iodide of Potassium	2 grains.
Glacial Acetic Acid	4 drops.
Distilled or Filtered Rain-water	12 ounces.

Dissolve the Nitrate of Silver in three ounces of the water, and the Iodide of Potassium in one ounce of water. Mix these two solutions, shake well, then add the remaining eight ounces of water, and filter to separate the yellow precipitate which is formed, and to the filtered liquid add the Acetic Acid.

This solution will remain in perfect action sometimes for months, merely requiring the addition of a little fused Nitrate of Silver to be added from time to time, to keep up the solution to its original strength.

Many writers with economical notions recommend a Bath Solution of 30 grains to the ounce for the dry process, but such recommendations tend much to mislead the amateur and increase the chances of failure. A moment's reflection should convince any one, that, as we require a rich creamy film on our prepared plate, we must of necessity use a highly Iodized Collodion, and consequently a *strong* Bath Solution to fully decompose it. My Bath Solution is never allowed to become lower than 35 grains, and frequently contains 40 grains to the ounce. I test it after preparing each 30 or 40 Plates with the Bath Tester, as described at page 9, and increase its strength according to its requirements.

PREPARED ALBUMEN.

Take any number of eggs, carefully separate the yolk and germ; pour the white into a measure, and to every three ounces of this Albumen add an equal bulk of water and twenty drops of *the strongest* liquor ammonia; stir the whole together with a glass rod for two minutes, and leave it to rest for about twelve hours. Then strain through fine muslin, and store away in 4-ounce bottles for use.

Albumen thus prepared will keep good for months (if kept closely corked), becoming more limpid, and filtering with less difficulty. Decomposition shows itself by the fluid becoming opaque, and with stringy masses floating in it. When this occurs reject it at once, and prepare a fresh quantity.

CHLORIDE OF AMMONIUM SOLUTION.

Chloride of Ammonium.....	2 scruples.
Distilled or Filtered Rain-water	4 ounces.

Dissolve and filter.

PYROGALLIC SOLUTION.

Pyrogallic Acid	12 grains.
Citric Acid	3 grains.
Distilled or Filtered Rain-water	4 ounces.

Dissolve and filter.

This solution will not keep good more than a few days in summer.

The above strength of Developing Solution is to be employed when the operating-room is about 60° F.; but may be diluted with one third its bulk of distilled water in the height of summer, and the Citric Acid reduced one half in winter.

SILVER DEVELOPING SOLUTION.

Nitrate of Silver	40 grains.
Distilled or Filtered Rain-water	2 ounces.

Dissolve.

FIXING SOLUTION.

Hyposulphite of Soda	8 ounces.
Water	16 ounces.

Dissolve.

CLEANING THE PLATE.

It is advisable to use none but the best patent plate-glass, and the edges should be just sufficiently ground to prevent the sharp corners cutting the fingers. To clean a new Plate, pour four or five drops of the Plate-cleaning Solution over the centre of the plate, and with a pledget of linen well rub it over every part, back and front; then, without waiting for the plate to dry, remove all traces of moisture with a linen cloth, and polish with another linen cloth, holding the plate by the cloth, and not by the hand, so as to prevent the slightest grease being communicated to it. The cloths employed should be of a material sold as "fine diaper," and must be well freed

* Nitrate of Silver and other Chemicals are sold by the Avoirdupois ounce of 437½ grains, and it is this and not the troy ounce of 480 grains that is here to be employed

from grease or soap, by careful washing in soda and water, then plentifully rinsed in water and dried; also the one used as a polisher should be kept quite dry. Occasional breathing on the plate during the polishing, and then holding it obliquely, so that the moisture deposited may be seen by reflected light, will serve to point out whether a plate is clean or not. If the moisture of the breath is deposited in patches, more cleaning is required, but if the deposit is evenly spread over the whole surface, it may safely be considered as clean. Glass plates after being once used, require to soak an hour in a solution of four ounces of common washing soda to one pint of water, so that the hardened coating may be softened and easily rubbed off; they have then to be cleaned, as before mentioned, for new plates; but should the surface have an iridescent appearance, through a slight reduction of silver, it will be necessary to soak in a mixture of equal parts of common nitric acid and water for ten minutes; then rinse in water, and proceed to clean as before described.

COATING WITH

IODIZED COLLODION.

Before proceeding to coat the plate, it is necessary that the Iodized Collodion should have been allowed to stand for twelve hours, so that any floating particles may fall to the bottom, or else this fluid must be filtered through filtering paper: and in all cases the dust and dried crust of the Collodion, which may adhere to the neck of the bottle, must be carefully removed, otherwise spots or stains will be produced on the plate.

If particles of dust are floating in the air of the operating room, it will be useless to attempt to coat a plate, as they will deposit themselves on it, and serve as a nucleus for a stain in the after-process. For this reason it is recommended to clean the plates in another room, so as not to disturb the atmosphere of the operating room from this cause.

Having ascertained that the glass plate is perfectly clean and *dry*, grasp it firmly by applying the tips of the fingers and thumb of the left hand to the two sides, then take the neck *p* of the plate-holder

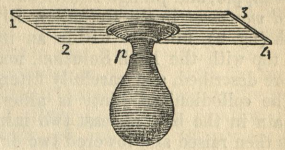

Fig. 1.

(fig. 1), between the first and second fingers of the right hand; press the ball at *r* inwards with the thumb, and apply the concave part to the centre of the glass plate; remove the pressure of the thumb, and the plate will be found to adhere.

When such is the case, transfer the ball to the left hand, and hold it so that the glass plate shall be horizontal; then remove the stopper from the Iodized Collodion bottle, and, holding it in the right hand, pour the Collodion on the glass plate in sufficient quantity to form a circular pool extending to near the edges; next incline the plate so that the fluid may flow to corner No. 4, fig. 1, then to No. 3, then to No. 2, and drain the superfluous Collodion back into the bottle by corner No. 1, holding the plate in a vertical direction. Give the plate a rocking motion on the neck of the bottle by very lightly raising and depressing corner No. 4, so that any lines or furrows which are found may run into each other. Continue this until the covered surface of

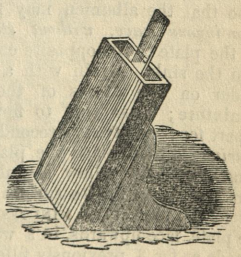

Fig. 2.

the plate appears thoroughly set from the evaporation of the ether; when this takes place, compress the ball of the plate-holde

and detach it from the plate. Now lay the the plate, collodion-side upwards, on a glass dipper, and plunge it with *one downward movement* in the Collodion Dipping Bath (fig. 2), filled to within an inch of the top with the Bath Solution, made as before described, and carefully filtered.*

The collodionized Plate is allowed to remain in the bath at least two minutes; it is then raised and lowered two or three times, in order to facilitate the removal of the *oily appearance* which the plate first presents. When the surface appears uniformly wetted, the plate is removed from the dipper, and the excess of solution drained off; it is then placed, collodion-side upwards, in a Gutta Percha tray, a trifle larger than the plate, into which (for a stereoscopic size Plate) six drams of water have been introduced. This "diluting" tray is then gently inclined, so that the water may flow over every part of the plate in all directions; continue this for ONE MINUTE, so as evenly to dilute the Bath Solution on the surface. Then remove the plate with a silver wire hook, and attach the globe plateholder, and, after draining for five seconds, bring the plate horizontal, and pour on it the Albumen mixture, prepared as follows:

Take of prepared albumen half an ounce, of water half an ounce, and of chloride of ammonium solution one ounce; shake well together, and filter through filtering paper, or a fragment of sponge slightly plugged into the neck of a clean glass funnel. Pour one dram of this Albumen mixture on at the end opposite to the one drained from, and incline the plate so that the albumen may flow in *one continuous wave, without stopping*, across the plate to the opposite end, and off into the sink. Drain with a shake, and pour on two drams of the albumen mixture; cause this to flow over every part for about twenty seconds *without pouring off*, then place the plate on a levelling stand, and allow the albumen mixture to remain on its surface undisturbed for at least FIVE MINUTES; then lay the plate, face upwards, in a washing-tray, made as fig. 3, previously filled with water; shake the tray from side to side with some violence, so as to agitate the water thoroughly for twenty seconds;

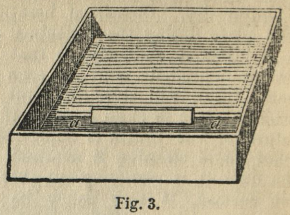

Fig. 3.

drain off the water, and again fill the tray by pouring fresh water into it, so as to fall at the part *a* of the tray, and *not on the surface of the film*. Again agitate for twenty seconds, throw out the second water, fill up and agitate again for another twenty seconds; then lift the plate out with a silver hook, and stand up to drain for half an hour, in a dark cupboard, perfectly free from light, with one corner resting on two or three thicknesses of filtering paper, so that the upper surface may touch the wall *at one point only*; lastly, complete the drying in an oven, or by artificial means, taking care that the temperature does not exceed 130°.

When these plates are thoroughly dry, they may be placed in the camera backs, or stowed away in light-tight boxes, and carefully protected from chemical or sulphurous vapours; and, as far as can at present be judged, they will keep an indefinite time, *as not the slightest deterioration or loss of sensibility has occurred in plates kept three months in summer.*

It is found most advisable to reject the Albumen after being once used, and to coat the next plate with another quantity; also to reject the water after being used to wash one plate in the Gutta Percha Tray and to take a fresh quantity for the next plate.

In coating with Albumen, the presence of air-bubbles or dust must be guarded against. The former can easily be done by taking care, in pouring the Albumen on the plate, not to pour so as to generate air bubbles in the liquid. But should any be detected, hold the plate horizontally, and give it another coating of Albu-

* This, and all other operations (except exposure in the camera) must take place in a room from which white light is carefully excluded.

men, then incline the plate so that the bulk of the liquid shall pass over and carry off the bubbles with the running stream. Dust on the plate must be prevented by operating in a room as free from this photographic enemy as possible.

EXPOSURE IN THE CAMERA.

The time of exposure in the camera varies according to the intensity of the light, and the aperture and focal length of the lens; therefore to give the exact time would be impossible, but, as a general rule, a light building, well illuminated by sunlight, would require about—

½	minute with lens of	4½	in. focus, and	⅛ in. stop.
1	,,	4½	,,	¼
1½	,,	10	,,	¼
3	,,	14	,,	¼
4	,,	16	,,	½

A light building with foliage requires about one-fourth longer exposure; but for masses of rock, and foliage of a dark character, three or four times the exposure above stated. In winter, all these exposures must be doubled; *but at all times expose for the deepest shades, as the high lights are but little liable to injury from over-exposure.*

DEVELOPING THE IMAGE.

The plate, on being taken into the operating room, is placed on a levelling stand, and distilled or filtered rain-water poured over it, so as completely to moisten every part of the surface and remove any particles of adherent dust; then drain slightly, and pour over its surface a mixture of (for a stereoscopic plate) ten drops of silver developing solution, and four drams of pyrogallic solution. Pour this on and off repeatedly from opposite corners, so as to keep it constantly on the move.

The image appears rapidly;* but should the developing solution become turbid, throw it away, and mix a second quantity, and if the development appears unequal, wash the plate with water, drain slightly, and pour on newly-mixed developing fluid repeatedly to the weakest part, until an equalisation is effected; then cover the whole surface, and continue pouring on and off until the image is sufficiently intense, increasing the quantity of silver developing solution if a deficiency of intensity is perceptible. Lastly, wash so as to free the surface from the developing fluid, and the picture is ready for fixing.

In general a good picture takes from one to three minutes to develop, and the condition of the sky will serve to indicate whether the proper amount of exposure has been given. An under-exposed picture has a dense sky, but the details in the deep shades are deficient; whereas in an over-exposed picture the details are well out, but the sky is transparent and generally of a greenish red tint; such pictures, moreover, possess no contrasts of light and shade; whereas, when the proper amount of exposure has been given, the sky is perfectly opaque, the middle tints finely developed, and the details apparent in the deepest shades, with perfect contrasts of light and shade.

* If the temperature of the operating room is allowed to fall below 60°, the development proceeds more slowly, or even ceases altogether. In such cases heat the developing solutions to about 80°, and renew as often as necessary.

FIXING THE IMAGE.

The Plate, having been thoroughly freed from the developing fluid by washing, is placed on the levelling stand, and the surface covered with fixing solution. In a minute or two, the yellow opalescent colour of the film will disappear; when this occurs *well wash with water*, and lean the plate against the wall to drain and dry. The surface, when dry, is sufficiently hard to resist any *slight* violence; but, as a further protection, warm the plate slightly all over near a good fire, then pour over its surface Horne and Thornthwaite's Negative Varnish, in the same manner as Collodion is applied. Allow the superfluous varnish to drain back into the bottle; hold the plate again before the fire until the whole of the spirit is evaporated, and, when cold, the plate is ready to be printed from, so as to produce any number of positive pictures, on either paper or glass.

CONCLUDING HINTS.

Clean the glass Plates carefully with very clean cloths, avoiding especially those used to wipe the hands after coating with Albumen.

Filter the Bath Solution whenever about to prepare a lot of Plates; and, when not in use, keep it in a stoppered bottle, in a dark corner of the operating room, so that the full glare of daylight may at no time fall on it.

Allow the Collodion to set thoroughly before immersion in the Nitrate Bath, or it may become detached in washing or after fixing; but, as a matter of course, this must not be carried so far that any part may become dry, or the Nitrate Bath will act unequally on the film.

Iodized Collodion that has become too thick for use by evaporation, may be diluted with rectified Sulphuric Ether; but *Methylated* Ether must not be used for this purpose.

After sensitizing the Collodion film, wash as described, and do not allow water to fall directly on the surface of the plate, or unequal patches will show themselves in developing.

The dilute Albumen that has been employed to coat one Plate must be thrown away, and a second quantity taken for the next Plate.

Use two globe plate-holders, one for collodionising the Plate, and the second for coating with Albumen, but carefully avoid using the one ordinarily employed for the Albumen to coat a plate with Collodion, as Albumen would thus be introduced into the Bath Solution, which would speedily spoil it for the purpose.

Handle the coated Plate as little as possible, and always wash the hands after coating with Albumen, before removing another plate from the bath; indeed, never take up a Plate without washing and drying the hands on a clean towel.

Give a full exposure in the Camera, or the resulting negative will be harsh, and produce black and white prints without middle tints.

Keep the glass used for the developing mixture perfectly clean.

Take especial care that no gleam of white light falls on the Plates during preparation or drying, and when dry, stow away in *light-tight* boxes of mahogany or tin, if not required for immediate use.

In developing, take especial care that the developing fluid is kept on the move by being repeatedly poured on and off the plate, or mottling will be the result.

Guard against over development, as a comparatively weak negative by this process will print well, owing to the nature of the deposit forming the shades having a greater action, in stopping the light whilst printing, than that produced by the ordinary Collodion process.

I have thus given what I hope will prove a clear description of this beautiful process, and as success with it follows only from paying attention to *minute* particulars, I would ask those who are led to make a trial of it from my description, to *strictly* follow the plan I have laid down, as a slight alteration of manipulation frequently gives rise to vexatious failures. Should any difficulty arise, I shall be happy to answer any queries by post; but it would much facilitate my doing so if such queries were written on paper, distinct from the letter which accompanies it, leaving sufficient space between each query for my reply.

WILLIAM ACKLAND.

122, Newgate Street, London, E. C.

June 4th, 1860.

BATH TESTER.

In working with either the Wet or Dry Collodion Process, and in Printing Paper Positives, it is absolutely essential that the Bath Solution should be preserved as near as possible to its original strength ; and if it falls much below this strength, Nitrate of Silver must be added to supply the deficiency.

Many instruments have been devised for this purpose, but the form shown by fig. 1 is the most simple in action, and sufficiently exact for the purpose. To use it we must proceed as follows :—

Take of highly dried and perfectly pnre Chloride of Sodium 84¾ grains, and dissolve it in 20 ounces of distilled water. This forms the Test Solution, and requires to be made with exactness, or the result obtained by its use will be erroneous. A second solution is also needed ; this is made by dissolving 20 grains of Bichromate of Potash in 1 ounce of water.

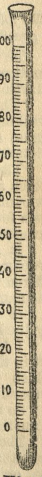

Fig 1.

To test the strength of a Bath Solution, take the Bath Tester, Fig. 1, and drop into it ONE DROP *only* of Bichromate of Potash Solution, then fill the tube up to the lowest division, marked 0, with the Bath Solution, and add the standard Test Solution gradually, shaking at frequent intervals ; when the colour of the precipitate, which was at first brick red, changes to a lighter tint, add the Test Solution more gradually, and continue to shake up between each addition. Continue to add the Test Solution drop by drop until the red tint of the precipitate suddenly changes to white, showing that all the Nitrate of Silver is decomposed, and that enough Test solution has been added. Now read off the division on the level with the surface of the fluid in the Bath Tester, and it will be equal to the number of grains of Nitrate of Silver contained in each ounce of the Bath Solution. Thus, supposing, after having performed the experiment, the fluid in the Bath Tester stood level with the 39th division (counting from below upwards, the same as the tube is figured), this would indicate that each ounce of the Bath Solution tested contained 39 grains of Nitrate of Silver.

This plan of using Bichromate of Potash to show by a change of colour when all the Nitrate of Silver is converted into Chloride was published some years since in the "Photographic Journal," and although but little used, answers perfectly in all cases except to test the Aceto-nitrate of Silver Bath, after having been used to excite Collodio-albumen Plates. In this case, the precipitate which forms on adding the Test Solution remains coloured, however much is added ; therefore, the use of the Bichromate of Potash Solution must here be dispensed with, and the Test Solution added gradually, shaking after each addition, and allowing the white Chloride of Silver which is formed to settle down, until the Test Solution ceases to produce any more cloudiness in the clear portion of the contents. The division level with the surface of the fluid in the Bath-tester here also indicates the number of grains of Nitrate of Silver per ounce.

The following brief communication, read by Mr. Martin, at a Meeting of the South London Photographic Society, on the 15th December, 1859, will convey a general idea of the merits of this article.

The Vice-President then announced that Messrs. Martin and Keens would contribute a continuation of the *Photographic Jottings*, No. 2. The first of which was introduced by Mr. J. Martin, upon the value of a preparation called the CRYSTAL ENAMEL.

"There are few practical photographers who have gone through the process of toning, fixing, and washing a positive print on paper, who can have failed to observe the extreme brilliancy in the high lights and middle tints, and the beautiful transparency in the deeper shadows possessed by the picture while floating in the water employed for the removal of the hyposulphite of soda.

"The mere allusion to this will, I am sure, be sufficient to awaken a recollection of the desire which all have entertained that the picture might be made to retain, or have imparted to it, the same amount of brilliancy when dried and mounted; this however it is hardly necessary for me to add has been found hitherto unattainable, if we except the simple coating with gelatine, adopted, I believe, principally by some French photographers.

"It affords me much pleasure, therefore, to be able to bring under your notice this evening a preparation which has been in occasional use on the continent for some months, and is being now offered to English photographers by Messrs. HORNE and THORNTHWAITE, of Newgate Street, unde the name of CRYSTAL ENAMEL.

"It would be difficult to convey in words alone an adequate idea of the vast improvement effected by the application of this preparation.

"I have therefore brought with me and submit for your inspection six pairs of photographs, one set in the ordinary condition, and the other coated with the enamel; a comparative examination of which will I am sure, abundantly demonstrate the power which this preparation possesses of imparting that liquid transparency which has so long been a desideratum.

"So much for the *apparent* advantages resulting from the employment of this preparation; there is another, however, which is not so obvious at first sight, of even still greater importance.

"The permanency of positive prints on paper is the one thing as yet unsecured to photographers, notwithstanding the elaborate researches and numerous experiments so carefully conducted with that object in view; and it is not unknown to those who have given attention to the subject, that this want of permanence is due in no small degree to the alternate and combined action of air and moisture upon the chemical constituents of the picture. Hence it follows that, if these can be protected from such adverse influences, the decomposition or fading will be arrested and permanency arrived at.

"I do not mean, of course, roundly to assert that we have in this preparation the grand *panacea* for the great photographic evil; but to say that if it be admitted that a well-washed photographic print is permanent if it were not for its continued exposure to air and moisture—and if it be further admitted that resinous substances, such as are contained in this enamel, have the property of protecting delicate surfaces from the air—then it seems to me that we at least bring together the conditions calculated to ensure the desired permanence; but, whether we shall accomplish that end, of course the lapse of time only can show.

"I should be leaving my notice of this unique preparation incomplete if I did not describe the method of manipulation, which is simple in the extreme.

"Having provided yourself with a bottle of the CRYSTAL ENAMEL, it is only necessary to prepare one solution, which is done by dissolving (by the aid of heat) 10 grains of Swinborne's gelatine in one ounce of water. This is applied, while still warm, with a flat camel's hair brush over the whole surface of the photograph, including the card-board upon which it is mounted. This coating of size, if I may so term it, is allowed to set hard and dry; the picture is then either hot-pressed or burnished with an agate burnisher; a piece of cotton wool, compressed moderately tight to about the size of a walnut, is next nearly saturated with the CRYSTAL ENAMEL, and in this condition is wrapped in a piece of clean calico rag, which is afterwards just lightly touched by the finger dipped in linseed oil: the whole is then gently rubbed, with a rather short circular motion, over the surface to be enamelled, and the application continued until the required brilliancy is obtained; lastly, finish by applying, in the same manner, alcohol and linseed oil."

The usual vote of thanks was awarded to Mr. Martin.